

U.S. DEPARTMENT OF TRANSPORTATION

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RECORD OF DECISION FHWA-NH-EIS-02-01-F

FEDERAL HIGHWAY ADMINISTRATION

I-93, SALEM TO MANCHESTER
IM-IR-93-1(174)0, 10418-C
SALEM, WINDHAM, DERRY, LONDONDERRY, MANCHESTER
ROCKINGHAM AND HILLSBOROUGH COUNTIES,
NEW HAMPSHIRE

1.0 DECISION

1.1 Summary

This Record of Decision is for the proposed improvements to I-93 from Salem to Manchester, New Hampshire. The purpose of the proposed action is to improve transportation efficiency and reduce safety deficiencies associated with this 31.9-km (19.8-mile) section of I-93 between Salem and Manchester, New Hampshire. Options including reactivating rail service, improving bus transit service, and other transportation demand management strategies that reduce vehicle trips on I-93 have been considered, in addition to widening the mainline and reconstructing the interchanges.

Based on (1) a detailed social, economic, and environmental analysis conducted during the preparation of the Draft and Final Environmental Impact Statements (DEIS) (FEIS); (2) the extensive coordination with Federal and State natural resource agencies; and, (3) a review of public comments provided on the DEIS and FEIS and during the public hearings, the Federal Highway Administration (FHWA) has selected the Four-Lane Alternative for implementation. The Four-Lane Alternative is the Environmentally Preferred Alternative since it best balances the need to provide safe and efficient transportation with social, economic, and natural environment concerns.

This Record of Decision describes the Selected Alternative, summarizes the rationale for the selection, describes measures to minimize harm, discusses monitoring of such measures, and sets forth FHWA's responses to comments received on the FEIS.

1.2 Description of Selected Alternative

The Selected Alternative provides four lanes in each direction (northbound and southbound) along I-93, beginning at the Massachusetts/New Hampshire State line and extending 31.9 km (19.8 miles) northerly through Salem, Windham, Derry and Londonderry, and into Manchester, ending just north of the I-93/I-293 Interchange. In addition to the construction of two additional lanes in each direction, the Selected Alternative will make improvements to the five existing interchanges along the corridor, south of I-293. The Four-Lane Alternative is described on Pages 2-109 through 2-112 of the FEIS, Volume 1, and illustrated in Figure 2.7-1 through Figure 2.7-22 of the FEIS, Volume 2.

1.3 Implementation of Selected Alternative through Adaptive Management Approach

In order to comply with water quality standards, FHWA and New Hampshire Department of Transportation (NHDOT) have committed to no additional chloride loading from the project to impaired waterbodies within the corridor. To meet this commitment we have developed an adaptive management approach that allows the project to provide for current needs and allow efficient and safe operation through the design year of 2020, without causing or contributing to water quality violations.

The core component of this approach is to maintain salt usage/chloride loadings at existing levels and not increase loadings. To facilitate the maintenance of a widened I-93 while not increasing loadings, reductions in salt usage are required. A multi-faceted strategy to reduce salt usage has been developed and includes the following elements:

- The quantity of salt used on the improved roadway will be consistent with the Section 401 Water Quality Certification.
- The NHDOT will accomplish this by using a number of new and more effective and efficient application methods, applied technology, improved equipment and training. These include the use of salt brine solution in lieu of solid rock salt, a practice already underway in the corridor and successfully used by some other States.
- Along with the use of brine, NHDOT will be developing a salt management plan for the I-93 corridor to document reductions in salt usage and to establish an on-going process for monitoring and documenting the effectiveness of these efforts.
- NHDOT will also incorporate Road Weather Information System (RWIS) technology to provide maintenance staff with real time pavement temperature and moisture data, in order to maximize the efficiency of winter maintenance operations and reduce salt usage by the precise timing of materials application. Upgraded and improved equipment will also increase the efficiency of salt usage.
- As the vehicle fleet is replaced and refurbished over time the NHDOT will use such improvements as infrared sensors and underbody scraper plows.
- The NHDOT will also provide frequent and systematic training on salt management reduction techniques and on the location of environmentally sensitive areas along I-93 for maintenance personnel assigned to the I-93 corridor.

- NHDOT will continue to explore the effectiveness and practicability of alternative deicers, through limited pilot studies and experiments throughout the State, for potential use in environmentally sensitive areas.
- The NHDOT has agreed to support the NHDES in conducting the TMDLs for waterbodies in the corridor, designated as impaired for chloride, by providing information on NHDOT de-icer usage and de-icing practices, applying NHDOT data loggers to further data collection and monitoring efforts, and serving as a technical resource on best management practices for salt usage and application. They have also offered to participate in an appropriate portion of the cost for a waterbody-specific TMDL, in order to facilitate completion of such a study.

As noted above, NHDOT began using salt brine as an anti-icing application measure during the winter of 2004-2005. The continued use of salt brine will result in considerable reductions in gross tonnage as compared to the solid rock salt only situation. Based on current salt-brine application rates, calculations indicate that NHDOT could presently operate three lanes in each direction without any additional chloride loading. There is clear potential, as evidenced by use and application rates elsewhere in the country, for even more substantial reductions to application rates in New Hampshire. With the experience gained in best management practices during the winter seasons preceding construction, combined with improved technology and training, NHDOT may realize sufficient reductions to allow the project to fully meet the commitment to no additional chloride loading from the project.

If agreement between the NHDOT and the New Hampshire Department of Environmental Quality (NHDES) has not been reached prior to commencement of construction that new technology, best management practices, and/or other considerations are sufficient for the project to be completed in compliance with conditions placed on the Section 401 Water Quality Certification, NHDOT is prepared to incrementally implement the Selected Alternative. This would involve building the full footprint for the selected Four-Lane Alternative, but only paving and operating the highway as a six lane facility (three lanes in each direction). Under these circumstances, the fourth lane will be completed and opened to traffic when such agreement had been established. Bridges and their approaches will be built initially in the final four-lane configuration.

2.0 ALTERNATIVES CONSIDERED AND BASIS OF DECISION

2.1 Description of Alternatives Considered

Conceptual alternatives were identified and discussed in the NHDOT's Scoping Report (May 2000) and the subsequent Rationale Report (January 2001). Both of these documents were provided to the appropriate Federal and State resource agencies and comments solicited. Alternatives that were considered as a part of this process were High Occupancy Vehicle Lanes, Passenger Rail Service, Bus Service, Park and Ride Facilities, No-Build, I-93 widening concepts for 3 or 4 lanes in each direction, Interchange Improvements, and Transportation Management Systems Alternatives. This analysis, as discussed in Section 2.3.5.5 of the FEIS, concluded that passenger rail service would not divert sufficient vehicular trips from I-93 to make any marked

improvement in its operation. It would operate at LOS F in 2020 throughout the corridor (see Table 2.3-6 in the FEIS).

Based upon the collective consideration and analysis, as described in Sections 2.4 and 2.5 of Volume I of the FEIS, the following seven alternatives, or combination thereof, were selected as a reasonable range of alternatives for more detailed evaluation in the DEIS:

- 1. The No-Build Alternative, which essentially serves as the baseline condition for comparison with the Build Alternatives.
- 2. Transportation Systems Management (TSM) measures; specifically minor improvements such as ramp lengthening and lane widenings that can be accomplished within the existing right-of-way at minimal expense. Such measures generally do not address the long-term project purpose and need, but can help to alleviate problems in the near term. Two other TSM measures, ramp metering and shoulder lane use, were determined to be impractical and were not proposed for further consideration.
- 3. Widening I-93 to four (4) lanes in each direction for the entire length of the corridor (Salem to Manchester), including interchange improvements, in addition to constructing or expanding park-and-ride lots at Exits 2, 3, 4 and 5, and providing room and, as practical, constructing sub-grade for future rail transit service within the highway corridor.
- 4. Widening I-93 to three (3) lanes in each direction for the entire length of the corridor (Salem to Manchester), including interchange improvements, in addition to the same park-and-ride lot construction and provision for future rail transit service as noted with the four-lane widening alternative.
- 5. Widening I-93 to four (4) lanes in each direction south of, and through, Exit 3 and three (3) lanes north of Exit 3, including interchange improvements, along with the park-and-ride lots and rail transit provision proposed with either the three-(3), or four-(4), lane widening options. This is the so-called "Combination Alternative."
- 6. Transportation Demand Management (TDM) measures, specifically Intelligent Transportation Systems (ITS) techniques, as well as employer-based measures utilizing incentives and disincentives to encourage people to not drive alone. It was concluded that congestion pricing, another TDM measure, would be impracticable.
- 7. Improvements to bus service to include expanding existing service and providing enhanced ride-sharing opportunities to employment centers in northern Massachusetts.

In a Memorandum of Agreement signed in the Fall of 2002, the US Army Corps of Engineers (USACE), US Environmental Protection Agency (USEPA), US Fish & Wildlife Service (USFWS), Federal Transit Administration (FTA), NHDES, New Hampshire Fish and Game Department (NHF&GD), and the New Hampshire Division of Historical Resources (State Historic Preservation Office - SHPO) agreed that these alternatives represented a reasonable

range of alternatives. As the alternative concepts were developed, every effort was made to avoid or minimize environmental harm to identified resources.

2.2 Basis Of Decision

Improvements to I-93 are necessary to eliminate existing geometric deficiencies and reduce vehicular conflicts (see Table 3.2-4 in the FEIS for crash summary information). The Four-Lane Alternative rather than the Three-Lane Alternative was selected as the final configuration, since four lanes provide an adequate level of service for future traffic projections, with limited additional direct impacts to the environment, and at a similar cost (5% increase).

The Three-Lane Alternative would have resulted in 21.6 ha (53.3) to 28.9 ha (71.4 acres) of wetland impacts, 50,573 to 53,040 cubic meters (41 to 43 acre-feet) of floodplain impact, 76.9 ha to 97.2 ha (190 to 240 acres) of wildlife habitat impact, the displacement of 18-23 residential properties and 9-18 business properties, and impacts to 20-23 archeological sites and 4-8 historic sites. The range in impacts reflects different interchange alternatives. (See Fig 2.6-1 of Vol. 2 of the FEIS.) The Four-Lane Alternative (Selected Alternative) would result in 31.2 ha (77 acres) of wetland impact, 53,040 cubic meters (43 acre-feet) of floodplain impact, 105.3 ha (260 acres) of wildlife habitat impact, the displacement of 21 residential properties and 14 businesses, and impacts to 23 archaeological sites and 6 historical sites. As with the Three-Lane Alternative, there would be no impacts to public recreational resources. (See Fig 2.7-23 of Vol. 2 of the FEIS.) The Combination Alternative, which would provide 8 lanes from the State line northerly to south of Exit 3 and 6 lanes from Exit 3, including the Exit 3 improvements, northerly to the I-293 Interchange, would have resulted in 22.3 ha (55.0 acres) to 28.5 ha (70.5 acres) of wetland impacts, 50,573 to 53,040 cubic meters (41 to 43 acre-feet) of floodplain impacts, 85.0 to 99.2 ha (210 to 245 acres) of wildlife habitat impact, the displacement of 16 to 22 residential properties and 9-18 business properties and impacts to 20 to 23 archeological sites and 4 to 8 historic sites. (See the various sections by resource in Chapter 4 of the FEIS.) Refer to the FEIS Comment Summaries in Section 6.0 of this document for additional information regarding the consideration of environmental impacts.

Although additional bus service, rail options, and HOV lanes were considered, it is clear that widening I-93 was required to address existing and projected traffic congestion and safety concerns. Preliminary evaluations of all modal options identified I-93 improvements as providing substantially greater transportation benefits to more people than other modal improvements (Table 2.3-6 in the FEIS). For example, preliminary study of rail ridership indicated it could only reach approximately 3,000 daily boardings, if I-93 remained as two lanes in each direction. This would be a best case estimate, since any alternatives which increase the highway capacity will reduce rail ridership. Rail service without any improvements to I-93 would result in a LOS F condition throughout the entire 31.9-km (19.8-mile) section of I-93. Additionally, the No-Build would do nothing to reduce identified congestion and safety problems associated with the corridor (see Table 3.2-4). The Three-Lane Alternative with rail and enhanced bus service would result in a LOS E or F south of Exit 3 and LOS C or D north of Exit 3.

As a part of the FEIS traffic analysis evaluated 1997 conditions, as well as the future (2020) No-

Build, Three-Lane and Four-Lane Alternatives. Table 2.3-6 and Tables 4.2-1 through 4.2-3 of the FEIS depict these results. They illustrate that with the future No-Build there would be LOS E (capacity) and F (failure) conditions, with F from Exit 3 south and north of Exit 5. For the Three-Lane Alternative, there would be LOS F from Exit 1 south and LOS E between Exit 1 and 3. The Four-Lane Alternative would provide LOS D or better north of Exit 1 and LOS E south of it.

In response to comments on the FEIS concerning the potential effects of the Delphi Panel's population and employment projections, a further traffic analysis reflecting the induced traffic that may possibly occur, was conducted. When the potential traffic is considered, the Selected Alternative would provide LOS F from Exit 1 south, LOS E from Exit 3 south, and LOS C north of Exit 3. The Three-Lane Alternative would obviously perform worse with the induced traffic factored into the analysis.

While it has been suggested that a level of mass transit service similar to major metropolitan areas would address the I-93 congestion, New Hampshire could not afford to provide such a level of service similar to those areas. Even if they could, projected ridership figures are disappointing. Preliminary rail ridership volumes of about 3000 daily boardings in 2020 are limited, compared to the $89,000 \pm to 144,000 \pm vehicles$ projected to utilize I-93. This rail ridership figure would not influence the level of needed expansion of I-93. So the decision is whether 1) to eliminate an obvious constriction in the I-93 system between Massachusetts and Manchester, NH, and alleviate vehicular congestion using I-93, or 2) to provide a passenger rail service that is projected to serve only a few thousand riders, leaving 100,000± motorists in unacceptable and worsening levels of congestion. The NHDOT has appropriately decided that this constriction along the I-93 corridor needs to be addressed, but they have also committed to enhance existing transit service. While widening of I-93 is the primary improvement, ridesharing opportunities and expanded bus service will provide alternative choices for the public. Such service requires a bi-state approach to be effective. In March 2005, NHDOT and MassHighway signed a Memorandum of Understanding to perform a Transit Investment Study for the I-93 corridor, and it was initiated in April of 2005. We view this position as both balanced and appropriate and support this long-term solution.

3.0 **SECTION 4 (f)**

3.1 Section 4(f) Resources

There were 103 archeological sites identified in the study area, of which 27 are recommended to receive Phase II investigation. There are remnants of stone walls, associated with the Searles Castle (WND-D1), located in the current median of I-93. These features were identified during archeological investigations on the project and were treated as archeological resources, since the Searles Castle Historic District is separated from the wall remnants by I-93 Northbound.

Based on experience with archeological resources in NH, it was considered unlikely that any of the potentially impacted archeological sites would warrant preservation-in-place, but rather that satisfactory mitigation could be achieved through Phase III data recovery. Thus, Section 4(f) would not apply.

Six districts and 9 individual properties were determined eligible for the National Register of Historic Places. Through the Section 106 process (National Historic Preservation Act), the project's effect upon them was determined, and mitigation was proposed. This effort was carried out by the SHPO along with FHWA and NHDOT. It resulted in a Section 106 MOA (See Appendix G of Vol 3 of the FEIS), which documented effects upon, and mitigation for, the following properties that were determined eligible for the National Register of Historic Places, and was endorsed by SHPO, NHDOT, and FHWA:

- George F. Armstrong House (WND 0085), 86 Range Rd., Windham
- Robert Armstrong House (WND 0086), 88 Range Rd., Windham
- Robert J. Prowse Memorial Bridge (LON0116), Ash St. over I-93, Londonderry and
- Gearty House (LON0105), 117 Rockingham Rd., Londonderry

Additionally, a Section 4(f) impact occurs at the following sites, where some land acquisition from the site is necessary; however, there is no Section 106 adverse effect (i.e., the property acquisition does not impact any historically significant features of the eligible site):

- Kinzler House (SAL0204), 19 Cross Road, Salem
- Reed Paige Clark Homestead (LON0114), 79 Stonehenge Road, Londonderry

The Advisory Council for Historic Preservation was provided with a copy of the DEIS and had no comment on any of the Section 106 information contained therein. All further actions with respect to archeological data recovery or other mitigation will be done in accordance with the Section 106 regulations.

There were six public parks or recreation areas identified in the study area. None of these properties would be affected by the Selected Alternative.

3.2 Prudent and Feasible Alternatives

The Section 4(f) Evaluation in Section 5.0 of the FEIS documents that there are no prudent and feasible alternatives to the use of land from Section 4(f) properties, and the proposed action includes all planning to minimize harm to these properties resulting from such use.

4.0 MEASURES TO MINIMIZE HARM

The NHDOT developed a comprehensive mitigation and enhancement package pursuant to extensive resource agency review of the proposed mitigation options. With implementation of the mitigation package, it is believed that all practicable means to minimize environmental harm have been adopted. Additionally, throughout the preliminary design phase, minimization was considered, including the steepening of side slopes or construction of retaining walls. These

design modifications and additional opportunities will be evaluated and incorporated, where practicable, during final design.

The commitments outlined in the Section 11 of the FEIS include:

4.1 Transportation

- 1. NHDOT will coordinate with the Town of Windham to accommodate the Town's planning goals for the Exit 3 Interchange area.
- 2. Three new park-and-ride lots will be constructed at Exit 2, 3 and 5, in addition to the overall corridor highway improvements to support carpooling and enhance ride-sharing opportunities.
- 3. New park-and-ride facilities will include the construction of terminal facilities to support expanded and enhanced bus service in the corridor. A terminal facility will also be constructed at the existing park-and-ride lot at Exit 4 to promote consistent service within the corridor.
- 4. The park-and-ride facilities at Exit 2 and Exit 5 will be constructed in advance of the mainline highway widening work to provide options for commuters seeking alternatives during construction.
- 5. NHDOT will continue to work with regional and local officials to implement the recommendations of the Salem to Concord Bikeway Feasibility Study in lieu of incorridor bicycle facilities. Paved shoulders along intersecting side roads are proposed for shared use bicycle lanes. Providing suitable accessibility for bicycle users through interchange areas will be considered in more detail during final design.
- 6. The current bus service to Boston that operates in the corridor will be expanded to provide service from the new park-and-ride bus station facilities along with the existing Exit 4 lot. NHDOT is committed to supplementing transit service as an integral component of the Transportation System in the I-93 corridor as part of the funding strategy being developed.
- 7. All appropriate avenues of funding for bus service will be pursued including Congestion Mitigation and Air Quality Improvement Program (CMAQ) and FTA funds. Full funding of bus purchases is anticipated along with construction of other required capital improvements (terminal and bus maintenance facilities). Assistance with operating costs for a 3-year start-up period is proposed with the intention that the service will achieve financial viability and be self-sufficient beyond this start-up period. As part of the overall funding strategy, funds for a transit marketing program are included.
- 8. NHDOT will continue to work towards providing enhanced ride-sharing opportunities. NHDOT will continue working cooperatively with public transit agencies, the MPO's,

the Transportation Management Organizations and Transportation Management Associations (TMA), as well as the Commonwealth of Massachusetts, to develop a coordinated transit program for the I-93 corridor. NHDOT will work with CARAVAN for Commuters to develop concepts for a ride-sharing program from southern New Hampshire that serves the entire I-93 corridor. NHDOT further proposes to subsidize a commuter incentive program in its early stages.

- 9. NHDOT will continue to develop and improve on Incident Management procedures in the corridor relative to response time, minimizing traffic delays and addressing traffic diversion issues. A number of Incident Management practices will be considered and implemented in the near-term, during construction, and over the long-term, following construction.
- 10. Intelligent Transportation System (ITS) technologies will be incorporated into the overall I-93 improvements to better manage traffic/travel demand, enhance safety and capacity, and supplement Incident Management initiatives. ITS deployment will occur before, during, and after corridor construction.
- 11. The proposed layout will not preclude future mass transit opportunities within the I-93 corridor or along the former Manchester-Lawrence line. The Selected Alternative will accommodate room in the median to allow future mass transit opportunities in the corridor. In addition, the proposed layout will provide provisions, such as bridge replacements and continued grade-separated crossings at Exit 5, to facilitate possible future rail service on the Manchester-Lawrence line.
- 12. A Transit Investment Study has been jointly undertaken with the Commonwealth of Massachusetts to consider in more detail the long-term rail and transit needs and identify viable options for the overall I-93 corridor between Manchester and Boston. In March of 2005, NHDOT and MassHighway signed a Memorandum of Understanding that allowed initiation of a Transit Investment Study for the I-93 corridor in April 2005.

4.2 Air Quality

- 1. Air quality will continue to be addressed for the project through the regional Transportation Conformity Air Quality Analysis of the Statewide Transportation Improvement Program (STIP), which includes this project, in compliance with the State Implementation Plan (SIP). The project is, and will continue to be, included in a conforming STIP.
- 2. Mitigation measures for controlling fugitive dust emissions during construction will include wetting and stabilization of all work areas, cleaning paved roadways, and scheduling construction to minimize the amount and duration of exposed earth.
- 3. NHDOT will require that contractors involved with the reconstruction of I-93 include air pollution control devices on heavy diesel construction equipment in accordance with applicable State and Federal laws at the time of construction. The merits and

practicality of more stringent or voluntary specification measures will be considered during the final design process and in consultation with the contracting community at large.

4.3 Surface Water Resources

- 1. Approximately 50 different extended-detention basins and 24 grass swales will be incorporated into the project design. The design objective will be to treat runoff from the entire length of new and reconstructed roadway, including the park-and-ride facilities and the secondary roads and ramps associated with the interchange areas. Both the basins and swales will be designed to maximize treatment efficiencies. Typical grass drainage swales will also be utilized in the project to collect and convey stormwater runoff and will provide supplemental treatment benefits.
- 2. I-93 will be relocated toward the median in the vicinity of the Exit 3 Interchange to reduce the overall footprint of the interchange and provide additional buffer area between the highway and Canobie Lake and Cobbetts Pond to enhance water quality protections and opportunities.
- 3. The drainage design, treatment swales, and detention basins will include specific spill containment measures in the vicinity of Canobie Lake to capture and isolate any inadvertent hazardous material spills before they can reach Canobie Lake.
- 4. NHDOT will specify in the contract bid documents that only low phosphorus or no phosphorus fertilizers are to be used in the re-establishment of vegetation within the watershed areas of Canobie Lake and Cobbetts Pond to minimize the potential phosphorus contributions associated with the use of fertilizers during project construction.
- 5. Opportunities to divert runoff into the watershed of Canobie Lake will be further explored in final design, as requested by the Salem Board of Selectmen, in order to maximize the surface recharge to the Lake.
- 6. NHDOT will coordinate with regulated MS4 communities as part of its obligations in meeting the small MS4 regulations under the NPDES Phase II Program in addressing stormwater management and treatment measures, eliminating any illicit discharges within the storm drain systems, implementing spill prevention and containment measures with emergency response personnel, and general good housekeeping measures. NHDOT will prepare annual reports detailing the activities and efforts that were undertaken as part of the five-year Statewide Storm Water Management Plan under the NPDES Phase II Permit Program, and how the measurable goals were met.
- 7. NHDOT will continue to pursue best management practices for road salt to optimize the use of material, to maximize efficiency and effectiveness of de-icer application. The project will incorporate a Road Weather Information System (RWIS) to provide maintenance staff, real time pavement temperature and moisture data that supports

more effective decision-making. NHDOT will utilize the Maintenance Decision Support System (MDSS), an advanced decision support tool for winter maintenance managers currently under development, to maximize the efficiency of winter maintenance operations to reduce salt usage with precision timing of material application.

- 8. NHDOT will standardize the use of "pre-wetting" road salt and ground-oriented spreader application of road salt to limit scatter and increase effectiveness of applied de-icing material.
- 9. NHDOT will replace and refurbish its vehicle fleet and equipment used to maintain I-93 over approximately the next 10 years and will include equipment to increase efficiency of operations. Equipment purchases will include items such as infrared thermometers to adjust de-icer applications based on specific pavement temperature, and under body scraper plows which remove snow more effectively requiring less deicer.
- 10. NHDOT will institute the use of salt brine, a mixture of road salt and water spray applied to roadway surface, to reduce and mitigate the amount of road salt applied to this section of I-93.
- 11. Frequent and systematic training of maintenance personnel will be conducted for the crews maintaining I-93 on salt management reduction techniques and the environmentally sensitive areas along the corridor. Trained NHDOT personnel and equipment will be prioritized for the I-93 corridor winter maintenance over private contractors and equipment.
- 12. Sensitive environmental areas will be identified and marked for field crews maintaining I-93 and to raise awareness of the motoring public.
- 13. NHDOT will continue to explore the effectiveness and practicability of alternative deicers, through limited pilot studies and experiments throughout the State, for potential use in environmentally sensitive areas.
- 14. During the construction phase, additional measures will be undertaken as practicable to ensure that the water quality of Canobie Lake, Cobbetts Pond, and other brooks, streams and wetlands are protected. NHDOT will ensure that Storm Water Pollution Prevention Plans (SWPPP) are prepared for each construction contract per NHDES requirements and the USEPA NPDES Phase II requirements and guidelines for construction activities. The goal of the SWPPP(s) is to reduce or eliminate stormwater pollution from construction activity by implementing pollution control Best Management Practices (BMP's) to protect water quality, including designing and implementing erosion and sediment control measures appropriate for the project specific construction activities and resources. Prior to the commencement of work, the Contractor will submit an erosion control and stormwater management plan specific to the project that will present measures to be employed to limit the extent and duration of

- exposed soils, temporary stabilization measures to be used and containment measures to prevent downstream sedimentation and turbidity.
- 15. All requirements of the Construction General Permit (CGP) will be met for each construction contract including a Notice of Intent, implementation of the SWPPP, and Notice of Termination upon completion.
- 16. NHDOT will continue to participate with NHDES and USEPA with respect to the regional issues of elevated chloride levels in area streams. NHDOT will participate in continuing water quality monitoring efforts as they relate to characteristics of I-93's contributions and coordinate with NHDES relative to its Volunteer Lake Assessment Program (VLAP) for monitoring any future changes in chloride concentrations associated with Dinsmore Brook, Cobbetts Pond, and the tributaries to Canobie Lake. NHDOT will participate in the anticipated TMDL study and work towards implementing appropriate road salt management plans that may be developed. The NHDOT will comply with the provisions of the Section 401 Water Quality Certification, when issued.
- 17. NHDOT will also coordinate and exchange information with local DPW officials regarding new and more efficient ways to store and apply road salt for deicing purposes through the outreach and education efforts as part of the Phase II Storm Water Management Plan, discussed above. NHDOT will share its technical experiences and knowledge, provide technical assistance to communities, and investigate venues and opportunities, such as through the University of New Hampshire (UNH) Technology Transfer Center, for sharing knowledge and experience relative to road salt management and application techniques.
- 18. NHDOT will provide funding of up to \$3 million to the NHDES Drinking Water Supply Land Grant Program to be used to purchase property rights to aid in the protection of water quality around Massabesic Lake, which is used to supply drinking water to Manchester, and parts of Derry and Londonderry.

4.4 Groundwater Resources

- 1. The Selected Alternative will incorporate extended-detention basins and grassed swales to treat roadway runoff for nearly the entire new and reconstructed roadway, including existing pavement areas. This is consistent with NHDES's Recommendations for Groundwater Protection Measures When Siting or Improving Roadways, and Level 2 protection measures for all new and improved roadways in Wellhead Protection Areas (WHPAs), locally designated groundwater protection areas or areas classified as GA1 areas (i.e., watersheds or recharge areas to existing or future water supplies) under the WHPA Program.
- 2. Consistent with the NHDES (1995) recommendations, the practicability of Level 3 measures including impermeable drainage swales and detention basins, and diversion runoff will be evaluated during final design for portions of the reconstructed roadway

within 1,000 feet of a community well or 500 feet of the non-community, non-transient wells. This includes specifically the Boumil Grove Condominium's well in Londonderry which is within 500 feet of the proposed roadway area. In lieu of these measures, the possibility of connecting this condominium complex to the nearby municipal water system may also be explored.

- 3. With the "tight-shift" design option, the I-93 roadway in the vicinity of the Pennichuck wells will be relocated further away as part of the Selected Alternative, and will require only Level 2 protection measures.
- 4. The same mitigation measures relative to road salt that were described for Surface Water Resources will also protect groundwater resources.
- 5. As part of the final design, NHDOT will also identify and specify precautions to minimize potential blasting impacts during construction for all known public and private wells within 1000 feet of a blasting area. NHDOT will also coordinate with the area utilities just prior to construction to prevent and repair any inadvertent damage to underground distribution lines.
- 6. NHDOT will investigate and replace any wells that are subsequently found to be damaged or degraded as a result of NHDOT activities through its Well Replacement Program. In accordance with RSA 228:34, NHDOT will conduct remedial measures for any wells that are found to have been impacted by construction or maintenance activities in relation to a state highway.

4.5 Floodplains

- 1. Direct impacts to the 100-year floodplain and floodways will be minimized during final design, by steepening highway embankments and/or utilizing retaining walls where appropriate. Such locations include the areas adjacent to the Spicket River, Policy Brook, and Porcupine Brook in Salem; Beaver Brook in Derry and Londonderry, Wheeler Pond in Londonderry, and Cohas Brook in Manchester.
- 2. A series of up to 14 basins will be constructed at locations immediately adjacent to impacted floodplains or where natural valley storage is being lost.
- 3. Additional flood storage compensation will be created at locations adjacent to flood-susceptible brooks and rivers, or locations upgradient from flood-prone areas. Detention basins are being proposed for stormwater treatment and floodwater storage at a number of locations along the widened highway. These basins are typically designed to store up to a 50-year storm event before discharging to nearby watercourses.
- 4. The design of the wetland creation sites will include the goal of providing both floodflow alteration and compensatory flood storage. These sites include the Pelham

Road Mitigation Site, Waste Water Treatment Plant Site, and Baggett Site in Salem; Highway Median Site in Windham; and South Road Mitigation Site in Londonderry.

4.6 Farmlands

- 1. For impacts that cannot be avoided, owners will be compensated through the right-of-way and acquisition process.
- 2. Topsoil will be salvaged during construction and will be re-used on roadway side slopes for revegetation and stabilization.

4.7 Wetlands

1. Compensation for unavoidable losses of wetlands and other project impacts will include a combination of creation, restoration/enhancement, and preservation of the following project mitigation/enhancement package, involving protection of approximately 1,000 acres at 16 sites throughout the study corridor. The recommended mitigation sites are summarized as follows:

Salem

Total mitigation provided by four sites will amount to 90 acres (including creation, preservation, and flood storage replacement elements). These sites are:

- Cluff Crossing Road (Site #30), 27 acre parcel
- Pelham Road Mitigation Site (Site #31), 25-acre parcel
- Salem Wastewater Treatment Plant Site (Site #32), 32-acre site
- Baggett Property (Site #38) about 6 acres in size,

Windham

Total mitigation provided by three sites in Windham will amount to nearly 318 acres (creation, preservation, and flood storage replacement). Each of the sites is described below.

- Highway Median Site (Site #24), 17-acre parcel
- Armstrong Property (Site #49), 11-acre parcel
- Southeast Lands Area (Site # 45), approximately 290 acres

Derry

Total mitigation provided by the site in Derry would amount to nearly 200 acres (preservation). The proposed mitigation site is described below.

• Sybiak Farm Property (Site #16)

Londonderry

Total mitigation provided by three sites will amount to approximately 290 acres, including preservation, creation, and flood storage replacement. Each of these sites is discussed below.

• South Road Mitigation Site (Site #14 and 15), 75-acre parcel

- Norwood Site (Site #63), 37-acre parcel
- Musquash Brook Parcels (Site #61), 110 acres
- Scobie Pond Area Properties (Site #58), 70 acres

Manchester

Total mitigation provided by the Crystal Lake sites in Manchester will amount to about 120 acres (preservation). The sites are described below.

- Crystal Lake Area Properties (Site #3, 44, 46, 47, and 53).
- 2. As noted previously, \$3 million in funding will be provided to the NHDES Drinking Water Supply Land Grant Program to protect the watershed surrounding Massabesic Lake. This land and water quality protection effort, in combination with the commitment to provide funding to communities for planning technical assistance, will provide future protection of wetland, as well as upland, resources in the I-93 region.
- 3. Attempts will be made to further minimize wetland impacts during final design by steepening slope embankments, where appropriate.

4.8 Wildlife and Fisheries Resources

- 1. Direct habitat loss, in particular to wetlands, will be offset through the project mitigation in the form of extensive habitat preservation. Generally the preservation sites will be contiguous with adjacent undeveloped or protected properties to create larger unfragmented blocks and provide opportunity to manage portions for varying successional stages.
- 2. The design of the wetland creation sites will include the goal of replacing the wildlife functions of impacted wetlands. Construction plans for restoration, enhancement, and creation will attempt to maximize the diversity and interspersion of wildlife food and cover, as done at the advanced wetland mitigation sites in Salem (Pelham Road) and Londonderry (South Road). A diverse group of native wetland plant species will be planted, where appropriate, to create a high structural and plant species diversity attractive to a wide variety of wildlife.
- 3. All culverts and bridges at the major stream crossings along the highway corridor (i.e., Cohas Brook, Beaver Brook, Porcupine Brook and Policy Brook) will be examined during final design to determine how a dry-land passage ("shelf") for mammals can be incorporated into the structures.
- 4. Other culvert crossings for smaller perennial streams will also be examined to ensure there are no blockages to wildlife or fish passage. A number of potential improvements to culvert conditions to enhance passage of fish and wildlife have been identified and will be evaluated during final design and implemented where practical. For culverts that require replacement, consideration will be given to oversizing the new structures, as appropriate, to better facilitate wildlife crossing.

- 5. Data will also continue to be collected by District Maintenance staff on the frequency of wildlife-vehicle collisions so that this information can be used to decide whether additional warning signage or fencing along the highway is warranted.
- 6. Several measures will be taken during construction to further reduce impacts on wildlife habitat. The amount of land cleared of vegetation will be limited as practical, especially in areas where there are currently only narrow buffer strips between the highway and other human development. Re-vegetation of the land disturbed by construction activities will take place as soon as possible after construction is completed, so that erosion is minimized and wildlife habitat is restored. Brush clearing or tree thinning in forests adjacent to the construction areas will not be proposed. Where feasible and safe, snags (i.e., dead standing trees) will be left adjacent to the mowed sections of the right-of-way in order to provide perch sites, nesting cavities, and den sites for wildlife.
- 7. Maintenance of the highway right-of-way to provide clear zone areas will be limited to the degree practical. On the one hand, maintaining large swaths of open areas are expensive and not beneficial to wildlife. On the other hand, providing clear zones for motorist's safety and discouraging wildlife from approaching the highway will be important.

4.9 Endangered and Threatened Species

- 1. Mitigation of impacts to wild lupine south of Exit 3 will focus on relocating these individuals by means of re-seeding or transplantation. A written mitigation plan specific to this population will be completed in consultation with the New Hampshire Natural Heritage Inventory prior to construction.
- 2. A preconstruction study conducted in conjunction with the NHF&GD of potential eastern hognose snake habitat using GIS-level analysis and/or other means will evaluate a sample of known occupied habitats within southern New Hampshire to determine their characteristics. This effort will help identify potential habitat within the project area that might be affected.
- 3. Construction contractor personnel will be trained to recognize the hognose snake and be informed of its protected status through a cooperative effort of NHDOT and NHF&GD. Procedures for reporting occurrences of the snake will be established to ensure proper response and reporting of the snake, if encountered during construction.

4.10 Noise

1. Noise barriers will be constructed at 11 locations along the project corridor in accordance with noise analysis and applicable criteria. (See Table 4.8-2 of the FEIS)

2. Early construction of proposed noise barriers will be considered in the construction sequencing, as appropriate, so that they can provide a reduction in subsequent construction noise to the residences.

4.11 Visual Resources

- 1. Landscape planting and natural revegetation of all cut and fill slopes, and at the parkand-ride facilities, will be developed during final design, as appropriate.
- 2. Structural design considerations for drainage structures, bridges, etc., to enhance their visual appearance will be considered during final design.
- 3. Highway lighting at interchanges and park-and-ride facilities, where appropriate, will be designed with "cut offs" or similar features to limit unwanted light.
- 4. Sound walls will serve a dual purpose by mitigating for both noise and visual impacts. Landscaping amenities will also be added in conjunction with the construction of sound walls where practicable.
- 5. Privacy fencing will be constructed in four locations (at NH 111A in Windham, Fordway Extension in Derry, Charleston Avenue in Londonderry, and Rockingham Road in Londonderry) to help shield adjacent residential properties from the visual impacts of the highway.
- 6. Additional privacy fence locations or landscape screening to minimize the visual impact of the highway and mitigate for the loss of existing vegetative screening will be considered and evaluated as part of the discussions with affected property owners during final design.

4.12 Cultural Resources

- 1. A Section 106 Memorandum of Agreement (MOA) has been executed between the FHWA and SHPO, with concurrence by NHDOT. The specific mitigation measures are detailed in the MOA (Appendix G of the FEIS)
- 2. Archaeological investigations at the Phase II level will be conducted to determine eligibility of sites identified for further evaluation. Depending on site significance and determination of effects, mitigation may be required including preservation-in-place or data recovery.
- 3. Mitigation for the direct impact to the George F. Armstrong House is to document the buildings to Historic American Building Survey (HABS) standards. It will be reconveyed to the property owner or marketed with protective covenant for relocation. A portion of the demolition costs may be allocated as an incentive for relocation.

- 4. Mitigation for the direct impact to the Robert Armstrong House is to, in part, document the building to HABS standards. The building will be purchased and, if feasible, it will be relocated to a nearby location with a suitable setting. A building relocation study will be conducted for the move. The property will be conveyed to a new owner with agreed-to preservation/maintenance covenants.
- 5. Mitigation for removal of the Robert Prowse Memorial Bridge is, in part, to document the bridge to Historic American Engineering Records (HAER) standards. The bridge will be replaced by a steel rigid frame structure of compatible design, if feasible. A concerted effort will be made to find an adaptive reuse for the bridge prior to construction. Otherwise, it will be advertised and marketed for reuse by others. An interpretative exhibit about its design and fabrication will be placed at the Salem Rest Area.
- 6. Mitigation for impacts to the Gearty House property is to minimize acquisition and slope impacts. Further reductions in slope impacts and acquisition will be considered during final design.
- 7. NHDOT will document the stone walls associated with Searles Castle that are impacted by the project.
- 8. If impacted, cultural resources included in the wetland mitigation and park-and-ride sites will be documented.
- 9. NHDOT shall ensure that all purchased historic properties are secured and protected against damage.

4.13 Socio -Economic Resources

- 1. Properties requiring acquisition will be appraised utilizing techniques recognized and accepted by the appraising profession and in conformity with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, and applicable to New Hampshire State Law to determine fair market value. The amount offered for partial acquisitions will be the difference between the fair market value of the property before the highway is built and its value after the portion needed for the highway has been acquired.
- 2. The following relocation benefits will be made available to displaced residences:
 - Fair market value for acquired property
 - Relocation advisory assistance services
 - Payments for moving and relocation costs
 - Replacement housing payments for home owners
 - Residential mortgage interest differential payments and closing costs
 - Replacement housing payments for tenants
- 3. The following relocation benefits will be made available to displaced businesses:

- Fair market value for acquired property
- Relocation advisory assistance services
- Payments for actual reasonable moving costs
- Business re-establishment costs
- 4. Should identifying affordable housing for any displaced residents (owners or renters) within the existing housing stock and assistance programs prove infeasible, last resort housing will be made available, if necessary, in accordance with Section 206 of the Uniform Act and governing regulations. As part of the right-of-way acquisition process, particular attention will be given to the current residents of these properties to assure that the needs of the displaced individuals are adequately addressed and the project will not knowingly discriminate against low-income and minority residents of the project area.
- 5. NHDOT will continue to coordinate through the design process with the communities to develop project improvements in keeping with their planning goals for potential redevelopment in impacted interchange areas.

4.14 S econdary Land Use Impacts

\$3.5 million will be provided for the establishment of a Community Technical Assistance Program to help communities in the area influenced by this section of I-93 better deal with and manage growth-related issues.

4.15 Hazardous Materials

- 1. Initial Site Assessment (ISAs), and Preliminary Site Investigations (PSIs) as necessary, of properties to be acquired will be performed to address potential and confirmed areas of soil or groundwater contamination.
- 2. Based on the results of the PSIs, contamination may be identified. In the event contamination is identified, the following scenarios are likely:
 - Contamination is limited to groundwater that does not warrant remediation and the groundwater will not be encountered during construction.
 - Contamination is limited to soil that does not warrant remediation and the contaminated soil will not be encountered during construction.
 - The contaminated soil or groundwater identified requires remediation by NHDOT following property acquisition.
 - The contaminated groundwater encountered will not be encountered during construction and assessment/remediation is ongoing by the existing property owner as part of an existing Groundwater Management Zone (GMZ) permit.
 - Limits of solid waste will be categorized. Removal, or consolidation of solid waste on-site will be performed in consultation with NHDES.

- 3. If contaminated materials are expected to be encountered during construction, appropriate worker health and safety provisions and waste management provisions will be included in the construction documents. All work will be performed in accordance with applicable NHDES regulations and NHDES approved remedial action plans.
- 4. A comprehensive building audit will be performed prior to any scheduled demolition to identify and quantify all regulated building materials and special wastes. Abatement plans will be prepared to address the removal of all regulated building materials.

4.16 Construction

- To mitigate potential sedimentation impacts during construction, a detailed drainage
 and erosion control program including BMPs will be developed and implemented.
 Construction schedules will require that areas stripped of vegetation be limited in size
 and either surfaced or vegetated as quickly as possible after initial exposure.
 Temporary erosion check-dams will be installed during the construction period in
 appropriate locations.
- 2. The detailed guidance contained in NHDOT's Standard Specifications for Road and Bridge Construction, Section 699, Temporary Project Water Pollution Control (Soil Erosion) will be followed.
- 3. In general, construction will be accomplished during daylight hours to minimize noise impacts, although some night-time construction should be expected given the traffic volumes during daylight hours and the need to maintain traffic at these times.
- 4. A detailed Traffic Control Plan will be developed as part of the final design and instituted to reduce traffic-related short-term impacts and minimize delays. The plan will include the requirement to maintain two lanes of traffic in both directions along the mainline for normal construction activities, and during high volume traffic periods.
- 5. Intelligent Transportation Systems, such as Smart Workzone Technologies, will be employed to more efficiently manage traffic/travel demand and enhance incident management. Specific Incident Management procedures and protocols will be incorporated into the contract documents and specifications.
- 6. Construction activities will be coordinated with all property owners (both business and residential) to assure that reasonable access to properties is maintained. Temporary signing and other issues related to temporary relocation of access points, caused by construction activities, will be appropriately addressed on an individual basis.
- 7. Land that is disturbed by construction activities will be re-vegetated as soon as possible after construction is completed to minimize erosion and restore wildlife habitat.
- 8. Construction contractor personnel will be trained to recognize the hognose snake and be informed of its protected status through a cooperative effort of NHDOT and

NHF&GD. Procedures for reporting occurrences of the snake will be established to ensure proper response and reporting of the snake, if encountered during construction.

5.0 MONITORING PROGRAM

Construction and environmental commitment implementation of the I-93, Salem to Manchester, project will be supervised and controlled by the NHDOT's Construction and Environmental Bureaus. FHWA is responsible for ensuring that these commitments are implemented, and has a full oversight role for this project. It is also expected that the USACE and NHDES will make frequent compliance reviews to assure that the Section 404 Permit and State Wetland Permit conditions are satisfied. Strict erosion and sedimentation control provisions will be enforced.

NHDOT will participate with NHDES and USEPA in continuing water quality monitoring efforts as they relate to I-93's chloride contributions to nearby streams and in the anticipated TMDL study and work towards implementing appropriate road salt management plans.

6.0 COMMENTS ON THE FEIS

The USEPA published the notice of availability for the FEIS in the Federal Register on May 21, 2004. FHWA provided until June 21, 2004 for public review and received comments from the following parties:

USEPA; New Hampshire Department of Environmental Services (NHDES); Town Manager of Londonderry; Deerfield Open Space Committee; Deerfield Conservation Commission; Rockingham Planning Commission; Conservation Law Foundation; Audubon Society of New Hampshire; NH Public Interest Research Group; Sierra Club – New Hampshire Chapter; Society for the Protection of New Hampshire Forests; Appalachian Mountain Club; Clean Air-Cool Planet; Clean Water Action; Merrimack River Watershed Council, Inc.; New Hampshire Public Health Association; New Hampshire Rivers Council; The Jordan Institute; NH Lakes Association; Priscilla Mattson of the MV Sierra Club; Roger S. Wellington; Lucy Hall, David Ackley, Eleanor Ackley and Elizabeth Hall-Nilsen; Sara Dewey; Wendy Schorr; and, Richard Katzenberg

Many of the comments on the proposed project were similar and the following discussions present the most frequently raised comments and responses thereto. Documentation of the detailed consideration of all comments received on the FEIS is available for review upon request by contacting the New Hampshire Division, Federal Highway Administration, 19 Chenell Drive, Suite One, Concord, NH, 03301-8539, (or by phone: 603-228-0417).

6.1 Public Involvement:

Issues Raised in Comments on the FEIS:

Commenters stated that the public process was deficient because it precluded meaningful participation by the numerous communities that, while not among the five "corridor" communities through which I-93 travels, will be affected by the proposed highway widening.

Commenters suggested that the "I-93 Board of Directors", which was established through the "Environmental Streamlining Pilot Project" addressed critical issues that significantly shaped the EIS and, ultimately, the Selected Alternative without public involvement. They felt that despite the urgings from the USEPA and others that interested members of the environmental community should have been be allowed to participate in early decisions where "stage-setting" issues were addressed outside of the public's view. They considered that the nature of the meetings precluded fair and meaningful participation by interested stakeholders and members of the public. As a result, they believed that interested stakeholders were precluded from effectively participating in this process of determining the reasonable range of alternatives to be assessed as part of the NEPA process.

FHWA response:

Public Involvement Process

The public involvement process for I-93 was extensive and greatly exceeded the required process. No local official, agency, nor individual was precluded from participation in this project and, to the contrary, they were encouraged to do so. There were over 40 informational meetings held with local officials and the public throughout this process. All of these meetings were open to the public and public input was solicited and welcomed. These public meetings were the proper venue for interested members of the environmental community, who had the same opportunity to participate in the process as all other segments of the public. For a listing of the public participation opportunities, refer to Section 8 of the FEIS. Section 8.1 lists the Advisory Task Force Meetings; Section 8.2 lists the Resource Agency Meetings; Section 8.3 lists the local Public Officials and Public Informational Meetings; and Section 8.4 lists the two formal Public Hearings.

The public involvement process did extend beyond the five "corridor" communities of Salem, Windham, Derry, Londonderry, and Manchester. As noted in the FEIS's "Comments and Responses on DEIS" (Vol. 3 of FEIS), relevant excerpts from the DEIS dealing with secondary land use impacts and mitigation were mailed to the governing bodies of surrounding communities in the secondary impact area. Refer to Section 4.12.3 of the FEIS for a list of communities included in the secondary impact study area. Public notices were published in area newspapers regarding public informational meetings, conducted for this project, as well as the formal public hearings. Also, each community within the corridor and the secondary impact study area was notified of the schedule for the formal public hearings. Every community identified as a potential secondary impact study area was offered the opportunity to have a public meeting to discuss the project. At their requests, meetings were held in Concord, Chester, Auburn, Milford, Goffstown and Candia. (Milford is beyond the secondary impact study area.)

I-93 Board of Directors

The "Environmental Streamlining Pilot Project" and composition of the "I-93 Board of Directors" (Board) were determined by former U.S. Senator Smith's office. The Board was comprised of decision-making agencies in the NEPA and permit processes and was not intended to, nor did it, replace the substantial public participation process used on this project. The purpose of the Board Meetings was to attempt to reach consensus with

Federal and State decision-making agencies subsequent to extensive public meetings. This process did not alter the normal decision-making process, which depends heavily on public involvement.

6.2 Water Quality:

Issues Raised in Comments on the FEIS:

Commenters felt that the I-93 expansion project will significantly increase pollutant loadings and that it was the responsibility of the NHDOT and FHWA to assess the impacts to the aquatic environment and to propose adequate steps to avoid or mitigate these expected impacts. They stated that the large amount of additional pavement would clearly add more pollutants, such as chloride, to the aquatic environment and reduce natural recharge areas in the region.

Concerns were raised about ongoing violations of the chloride criteria in the study area. Violations of state water quality standards for chloride in streams in the I-93 corridor were noted. Numerous sources of these elevated levels of chloride were listed including runoff from the existing lanes of I-93, other roads, private parking lots, improperly managed local and private salt storage and handling facilities, and shallow well injections of public water supply filter backwash. Commenters believed that the FEIS did not fully characterize the potential impacts from salt use associated with the project or determine whether a solution exists to resolve existing and potential exceedances of the water quality standards. They encouraged FHWA to commit in the ROD to further analysis of the salt related issues including recent proposals by NHDES on how to do predictive modeling.

Commenters also felt that the FEIS' aquatic life impacts analysis was inadequate in that it focused solely on issues pertaining to structural impedances to the movement of aquatic wildlife, failing in any way to consider or assess the effect of changes in water quality (including violations of water quality standards for chlorides) on aquatic species.

Because of the concerns mentioned above, commenters believe that FHWA and NHDOT failed to demonstrate that the highway expansion can comply with water quality standards and satisfy 40 C.F.R. § 230.10(b)(1). Prior to issuance of the 404 permit, NHDOT must demonstrate that additional chloride loading from the proposed project would not cause or contribute to water quality standards violations. Commenters stated that regardless of whether NHDOT is responsible for some or all of the current water quality impairments relating to the use of sodium chlorides, any alternative that will cause or contribute to impaired conditions should not be permitted. They felt that NHDOT has not provided adequate mitigation measures, and that if the Selected Alternative was approved; it would violate NEPA, the Clean Water Act, and New Hampshire's wetlands and water quality laws.

Commenters recommended that the NHDOT work with NHDES and the corridor communities to address existing violations of State water quality standards. This would help local officials, such as Boards of Selectmen and Department of Public Works, understand how they are contributing to chloride contaminations of water resources within

and outside their jurisdiction. They encouraged development of 1) local ordinances and bylaws governing salt application and storage along with enforcement at both the local and, if necessary, the state levels; 2) incentives for compliance, and for those cases where incentives do not work, conservation agents should be given the power to enforce these bylaws in their towns.

They also felt that NHDOT and NHDES should 1) work with the corridor communities to help them clean up their public works maintenance facilities, such as that owned by Salem on Cross Road; 2) work with communities to eliminate uncovered, poorly managed salt piles on all commercial properties; 3) work with their own personnel as well as those of the corridor communities to minimize road salt application using the best management practices, proposed by NHDES in the draft Section 401 Water Quality Certification.

FHWA response:

Water Quality Concerns

FHWA and NHDOT have developed an appropriate strategy to address the water quality concerns that have been raised regarding chlorides. We have fully and adequately analyzed the water quality impacts of I-93. The mitigation measures for the project are extensive and more than sufficient to mitigate the projects impacts. The environmental process and documentation fully comply with NEPA, the Clean Water Act, and New Hampshire's water quality laws.

The FEIS included new information and recent data that led to revisions in the predicted chloride concentrations and related conclusions that were presented in the DEIS. The FEIS concluded that the future chloride concentrations could exceed the chronic water quality criteria for chloride in at least four streams (tributary to Harris Brook, south tributary to Canobie Lake, north tributary to Canobie Lake, and tributary to Cobbetts Pond – Dinsmore Brook at Exit 3). Also, based upon additional sampling results, NHDES has identified the following additional waterbodies as being impaired: Policy Brook and its tributary, Porcupine Brook, Beaver Brook and Little Cohas Brook. (These additional waterways receive substantial chloride contributions upstream of I-93.)

In order to comply with the water quality standards, FHWA and NHDOT commit to no additional chloride loading associated with the project. To meet this commitment we have developed an adaptive management approach that allows the project to provide for current needs and allow efficient and safe operation through the design year of 2020, without causing or contributing to water quality violations. Given the uncertainty surrounding the impacts to water quality and the fact that I-93 is not the primary contributor in many locations, we have determined that an adaptive management approach is appropriate. The National Environmental Policy Act (NEPA) Taskforce established by the Council of Environmental Quality (CEQ) recommended the use of adaptive management approaches in its September 2003 report on "Modernizing NEPA Implementation."

The core component of this approach is to maintain salt usage/chloride loadings at existing levels and not increase loadings. To facilitate the maintenance of a widened I-93 while not increasing loadings, reductions in salt usage are required. A multi-faceted strategy to

reduce salt usage has been developed. First, the quantity of salt used on the improved roadway will be consistent with the Section 401 Water Quality Certification. The NHDOT will accomplish this by using a number of new and more effective and efficient application methods, applied technology, improved equipment and training. These include the use of salt brine solution in lieu of solid rock salt, a practice already underway in the corridor. Along with the use of brine, NHDOT will be develop a salt management plan for the I-93 corridor to document reductions in salt usage and to establish an on-going process for monitoring and documenting the effectiveness of these efforts.

NHDOT will also incorporate Road Weather Information System (RWIS) technology to provide maintenance staff with real time pavement temperature and moisture data, in order to maximize the efficiency of winter maintenance operations and reduce salt usage by the precise timing of materials application. Upgraded and improved equipment will also increase the efficiency of salt usage. As the vehicle fleet is replaced and refurbished over time, the NHDOT will use such improvements as infrared sensors and underbody scraper plows. (Some of these practices were already in use by NHDOT during the winter of 2004/2005.) The State will also provide frequent and systematic training on salt management reduction techniques and on the location of environmentally sensitive areas along I-93 for maintenance personnel assigned to the I-93 corridor. NHDOT will also continue to explore the effectiveness and practicability of alternative de-icers for environmentally sensitive areas.

The NHDOT has agreed to support the NHDES in conducting the TMDLs for waterbodies in the corridor, designated as impaired for chloride, by providing information on NHDOT de-icer usage and de-icing practices, applying NHDOT data loggers to further data collection and monitoring efforts, and serving as a technical resource on best management practices for salt usage and application. They have also offered to participate in an appropriate portion of the cost for a waterbody-specific TMDL, in order to facilitate completion of such a study.

If agreement between the NHDOT and the NHDES has not been reached prior to commencement of construction that new technology, best management practices, and/or other considerations are sufficient for the project to be completed in compliance with conditions placed on the Section 401 Water Quality Certification, NHDOT is prepared to incrementally implement the Selected Alternative. This would involve building the full foot print for the Four-Lane Alternative, but only paving and operating the highway as a six-lane facility (three lanes in each direction). Under these circumstances, the fourth lane will be completed and opened to traffic when such agreement had been established. Bridges and their approaches will be built initially in the final four-lane configuration.

Impacts Analysis

Additional studies were performed regarding sodium chloride usage along I-93 and from other sources using data gathered through the winters of 2002-2003 and 2003-2004. Based upon the monitoring of chloride levels in nearby streams, both upstream and downstream of I-93, many of the elevated chloride levels in nearby streams are caused by sources other than I-93. As USEPA noted, those sources include road salt used on large commercial

parking lots, improperly located and managed salt piles, municipal roads, and the backwash from public water supply treatment systems. The recent data shows that in Policy Brook, the highest chloride concentrations were consistently observed upstream of I-93, resulting from sources other than the I-93 runoff. Furthermore, even if road salt was no longer applied on I-93, these upstream chloride concentrations would continue to be elevated and exceed the water quality standards. These upstream sources have existed for many years or, in some cases, have developed more recently under the same water quality protection regulations that this project is striving to address.

Nearly 100% of the highway runoff from both the existing and proposed portions of the roadway will be treated through extended detention basins and grass treatment swales to minimize these pollutant contributions. These proposed treatment measures also provide initial spill containment for possible vehicle-related hazardous spills, which also represent a substantial benefit for water quality protection that is not currently provided with the existing roadway. The Selected Alternative will move approximately 1,500 feet of the northbound lanes about 700 feet away from Canobie Lake, which also reduces the contamination potential for vehicle related spills in the watershed, increases buffer and provides further area for water quality treatment. NHDOT committed in the FEIS to using only low or no phosphorous fertilizers within the Canobie Lake watershed. The extensive water quality treatment measures, that will be provided, will be designed according to the NHDES Best Management Practices Design Guidance manual and are applicable for many pollutants that attach to sediment particles (i.e., certain metals and petroleum substances). The FEIS provided an appropriate analysis of the relative changes of impervious area associated with the project. Table 4.4-1 in the FEIS presented a breakdown of the estimated highway area (acres) and the percentage of I-93 roadway area within each watershed under existing and proposed conditions. The impacts to surface waters from phosphorous, as well as sodium and chloride, are discussed in Sections 4.4.1.2 and 4.4.1.3 of the FEIS.

The FEIS does account for microorganisms. The NHDES' acute and chronic criteria for chloride, which are often referenced in the FEIS, were established to avoid potential impacts to the "most sensitive" aquatic life species, which include microorganisms. In fact, a considerable amount of research has shown that most freshwater fish species can tolerate and thrive in waters with much higher chloride concentrations than that suggested by the criteria. (Birge, W.J. et al. 1985; Pickering, Q.H., Lazorchak, J.M., and Winks, K.L., 1996)

Mitigation Measures for Water Quality Impacts

USEPA believes that FHWA and NHDOT should undertake and be responsible for the suggested regional TMDL Study. However, the data clearly indicates that elevated chloride concentrations are a regional issue, influenced by many more sources than I-93. While the NHDOT and FHWA are committed to do their part, other sources should be held accountable for their contributions in a comprehensive approach to chloride reduction in the area. Numerous other sources are a major factor in the current water quality conditions in the area. In the Policy Brook watershed, for example, where the water quality violations are most egregious, the elevated chloride concentrations have very little to do with I-93. USEPA and NHDES should take appropriate measures from a regional perspective to develop a comprehensive approach to managing chloride loading to surface and

groundwater that addresses all sources and not just I-93. The NHDOT and FHWA are committed to be active partners in this process.

In addition to the commitments noted above, the NHDOT has also agreed to provide training to local officials regarding proper salt storage and application practices in hopes of reducing chloride contributions, particularly upstream of I-93. This training and outreach effort will be coordinated through, and built upon, NHDOT's NPDES II program outreach efforts with the MS4 communities. We encourage participation by NHDES to stress the importance of this issue and potential consequences. The local officials will be encouraged to develop and enforce local ordinances. Providing incentives for compliance with local water quality ordinances is not a responsibility of NHDOT or FHWA, but local officials can make provisions for such incentives. Providing conservation agents with enforcement powers, providing media coverage of this issue, and corrective actions need to be resolved between local officials and NHDES/USEPA. NHDOT has no legislative authority to require such controls (clean-up of local public works maintenance facilities or elimination of uncovered, poorly-managed salt piles on commercial properties) on local communities. However, the training and outreach efforts will help raise awareness of the issue and the need for proper maintenance and storage practices, enabling communities to act accordingly. Enforcement of such violations would appear to be the responsibility of NHDES and USEPA. As spelled out in Section 4.0, Measures to Minimize Harm, the NHDOT will take several steps to use more efficient application procedures and to train their personnel.

6.3 Wetlands/Section 404 Permit Process:

Issues Raised in Comments on the FEIS:

USEPA stated that the size and quality of the mitigation package described in their comments on the DEIS were more appropriate for the impacts expected from this project, which they continue to believe will be significant. They suggested that the project will still fall short of complying with the § 404(b)(1) Guidelines because the effects associated with filling 77 acres of wetlands, combined with other reasonably foreseeable impacts (indirect impacts) to wetlands in the study area would cause or contribute to significant adverse impacts on the aquatic environment.

Others commented that the expansion would impose environmental costs that either have been inadequately documented in the FEIS or will be inadequately mitigated by the proposed expansion project. They also felt the proposed mitigation plan remained inadequate and must be enhanced. These commenters felt that NHDOT failed to properly assess the direct, indirect and cumulative impacts of the proposed project including but not limited to impacts related to induced growth and development. They stated that this undermined the validity of the proposed mitigation plan because the impacts-assessment understates the true impacts of the Selected Alternative.

Commenters charged that the mitigation plan was inadequate and urged NHDOT and FHWA to continue efforts to strengthen the proposed mitigation package to address these

concerns and the significant impacts of the project. Commenters noted that the mitigation plan fails to adequately provide for the conservation of large, ecologically valuable parcels of land with habitat connectivity that will remain ecologically viable in the long-term (as opposed to becoming "islands" surrounded by development). They believed that additional mitigation is needed to reduce the impact to aquatic resources to a level below the threshold of significance, to protect large, unfragmented habitat blocks, and to act as an important pollution prevention measure. They considered the failure to provide such additional mitigation a violation of the Clean Water Act and its implementing regulations.

FHWA response:

There has been a thorough and comprehensive analysis of the wetland impacts of the Selected Alternative. The mitigation, proposed as a part of this project, far exceeds the minimum that is required to obtain a permit under the Section 404(b)(1) Guidelines. The Selected Alternative is in full compliance with NEPA, the Clean Water Act, and New Hampshire's wetlands laws.

Impact Analysis

The analysis of wetlands and wildlife, associated with those habitats, was determined to be sufficient by the USACE, USFWS, and USEPA to determine a Least Environmentally Damaging Practicable Alternative, which is eligible for a Section 404 Wetland Permit. The impacts associated with this project are clearly and appropriately documented in Section 4 of the FEIS. Where appropriate, there is specific discussion of potential indirect (secondary) impacts dealing with various resources (i.e., under Wetland Resources, there is a subsection (4.6.2.4) entitled Secondary Impacts). Additionally, there are subsections on Cumulative Impacts (4.11.2) and Secondary Land Use Impacts (4.12).

Secondary impacts to these resources are more difficult to anticipate but the FEIS did address this issue qualitatively in Section 4.12.8, Potential Secondary Land Use Impacts on Environmental Resources. Inventories were collected for each of the communities within the secondary impact study area, which addressed the areas of the various Towns, amount of conservation lands within each community, unfragmented tracts greater than 500 acres, farmland, availability of developable land, and unprotected priority open space lands. Estimates were made of potential land conversion as a result of the projected population and employment increases to give a sense of whether this growth could be accommodated without serious impact to these resources, if it was directed to appropriate areas by local ordinances. This information was being provided to all affected communities, so that they may take the right steps to minimize impacts to wetlands from future development. Without careful local oversight, and careful local, State, and Federal wetland permit application review, substantial impacts to natural resources could occur as a result of secondary impacts. For those proposals that require State or Federal wetland permits, such review should be thorough.

Mitigation Package

NHDOT's proposed mitigation and enhancement plan for this project is extraordinary. The NHDOT increased its proposed mitigation package from approximately 650 acres as proposed in the DEIS, to approximately 1000 acres, largely preservation lands, to offset

direct impacts to 77 acres of wetlands. (Refer to the list of wetland mitigation above in 4.7, Measures to Minimize Harm, for additional details.) The land within the wetland mitigation plan was identified in conjunction with Federal and State natural resource agencies, and it has their support. The proposed mitigation expands large ecologically valuable parcels, as was suggested by the Federal and State natural resource agencies. Additionally, NHDOT will provide funding of up to \$3 million to the NHDES Drinking Water Supply Land Grant Program to be used to purchase property rights to aid in the protection of water quality around Massabesic Lake, which is used to supply drinking water to Manchester, and parts of Derry and Londonderry.

USEPA stated in their August 25, 2003 letter, "...we do not intend to veto the widening of I-93 based on the size of the wetlands mitigation package." Thus, we are surprised that in their June 21, 2004 letter USEPA stated, "While NHDOT has expanded the mitigation plan, at this point we believe the project will still fall short of complying with the § 404(b)(1) guidelines because the effects associated with filling 77 acres of wetlands, combined with other reasonably foreseeable impacts to wetlands in the study area, would cause or contribute to significant adverse impacts on the aquatic environment."

Development pressure on the aquatic environment will continue into the future, regardless of whether I-93 is widened. Through the Community Technical Assistance Program, NHDOT will provide \$3.5 million in funding to help local officials within the study area manage any growth-related issues. Additional details regarding the Program are provided in the Indirect and Cumulative section below.

The impacts for which the mitigation is proposed are those that directly result from the proposed project. Future secondary growth is subject to local approval, as well as approval from State, and often Federal, permitting agencies. NHDES and USEPA, as well as the local officials, have specific authorities under wetland legislation to protect important resources from inappropriate development and discharges to aquatic resources. We would expect that these authorities would be applied to such future development to control these potential impacts and appropriate mitigation would be required of the developer.

6.4 Air Quality:

Issues raised in comments to the FEIS:

Commenters asserted that the FEIS failed to adequately assess and inform the public of the air quality impacts or benefits associated with all of the varying alternatives, including rail. They felt that a full air quality analysis, including a mesoscale analysis, is required of all alternatives to fully comply with NEPA, providing state planners with a full range of possibilities as they face more stringent air pollution budgets for nitrogen oxides and volatile organic compounds, as well as fine particulate pollution. They also felt that the FEIS fails to address the issue of air toxics in NH, as well as Massachusetts and that local communities would bear the brunt of NHDOT's actions with increased exposures to carcinogenic air pollutants from the 8-lane I-93 expansion. They thought that the FEIS fails to address the issue of greenhouse gases and the potential impacts of the proposed project on climate change. Finally, they felt that the FEIS fails to provide a commitment to

adequate mitigation for construction-related air pollution. It was requested that FHWA commit to require construction mitigation for fine particle emissions from diesel construction equipment for this project in the ROD. Specifically, it was requested that NHDOT include a contract specification requiring construction vehicle retrofits and/or the use of cleaner fuels.

FHWA response:

FHWA and NHDOT have fully and adequately analyzed the air quality impacts of I-93. We conducted the appropriate level of analysis and it focused on the relevant air quality issues. The FEIS outlined the necessary mitigation measures to sufficiently address the air quality impacts.

Mesoscale Analysis

The FEIS contained the appropriate level of analysis for air quality impacts. The FEIS contained a microscale analysis of carbon monoxide concentrations at sensitive reception locations. Other pollutants are regional in nature, rather than local, and are included in regional conformity analysis in accordance with USEPA regulations.

There is no additional requirement or need to conduct a mesoscale (regional) analysis or a comparative analysis of the air quality impacts or benefits of all alternatives, as suggested by the commenter. Under the transportation conformity provisions of the Clean Air Act, the subject project has already been included in regional emissions analyses as part of conformity determinations for the Salem-Plaistow-Windham MPO and the Southern New Hampshire Planning Commission transportation plans and transportation improvement programs (TIPs).

On December 14, 2004, FHWA and FTA determined that the transportation plans and TIPs for the two MPOs that include the subject project, conformed to the State Implementation Plan (SIP) for air quality in accordance with the Clean Air Act requirements. That determination was based on a regional analysis of the plans and TIPs, using MOBILE6 and the latest traffic and emission factor data, as well as favorable comments from USEPA. This determination was updated to conform with EPA's new 8-hour ozone standard using the MOBILE6.2 model, and FHWA and FTA completed a new determination on June 13, 2005. Thus, this project comes from conforming transportation plans and TIPs.

On December 14, 2004, FHWA and FTA also approved the NHDOT's FY 2005-2007 Statewide Transportation Improvement Program (STIP), which includes the conforming TIPs for the two affected MPOs (Salem-Plaistow-Windham Metropolitan Planning Organization and the Southern New Hampshire Planning Commission), and the subject project. On June 13, FHWA and FTA approved Amendment #2 to this STIP affirming compliance with EPA's new 8-hour ozone standard.

EPA designated areas nonattainment for the PM2.5 standard on January 5, 2005 with an effective date of April 5, 2005. The State of New Hampshire demonstrated that it met the PM2.5 National Ambient Air Quality Standard, and therefore was designated attainment under the PM2.5 standard. Given improved emission control technology and cleaner fuels,

highway related emissions are decreasing over time. It is unlikely that any project in an attainment area would result in PM2.5 air quality impacts. In addition, attainment areas are not subject to the conformity requirements under 40 CFR Part 93. Therefore a project level conformity analysis under the PM2.5 standard is not required in this area.

Air Toxics

In the FEIS, the results of an air quality analysis were presented documenting the predicted impacts of the alternatives considered. At that time, this analysis was based on the USEPA's current regulatory version of the mobile source emission factor model, MOBILE5b. MOBILE5b predicts emissions of the three principal compounds from onroad mobile vehicles (carbon monoxide, nitrogen oxides, and hydrocarbons).

In May of 2004, USEPA announced the availability, and approved the use, of the MOBILE6.2 model for regulatory applications. MOBILE6.2 provides the ability to predict emissions of a select number of Mobile Source Air Toxics (MSAT) compounds from onroad motor vehicles. Since its introduction, FHWA has been evaluating the use of MOBILE6.2 for MSAT analyses at the project-level, given that the model provides emission factors representative of a regional scale. The FHWA Resource Center performed an analysis of acetaldehyde, acrolein, benzene, 1,3-butadiene, diesel particulate matter, and formaldehyde (commonly referred to as priority MSATs) emissions for a hypothetical highway project designed to mitigate traffic conditions. The hypothetical project involved expansion of an existing urban freeway, plus upgraded arterials/collectors and freeway ramps to improve vehicular access. Since there are similarities to the I-93 improvement project, a brief summary of the major findings is provided:

- The analysis indicated that a significant decrease in MSAT emissions can be expected for a planned congestion-mitigation transportation project from current levels through future design year levels.
- The major mitigating factor in reducing mobile source air toxic emissions is the implementation of USEPA's new motor vehicle emission control standards.
- The No-Build Alternative is expected to carry less traffic than the Build Alternatives, but this is offset by an over-capacity traffic condition and the breakdown of travel speeds during an extended peak period. As a result, less total MSAT emissions are associated with the Build Alternatives compared to the No-Build Alternative.

A substantial decrease in MSAT emissions can be expected in the vicinity of the I-93 improvement project for the design year of 2020 compared with the base year of 1997. Reductions of over 80% (i.e., 81% for the Build Alternatives and 82% for the No-Build Alternative) are estimated from 1997 to 2020 due to the implementation of USEPA's mobile-source control programs, which include the reformulated gasoline program; a new cap on the toxics content of gasoline; the national low-emission vehicle standards; the Tier 2 motor vehicle emission standards and gasoline sulfur control requirements; and the heavy-duty engine and vehicle standards and on-highway diesel fuel sulfur control requirements.

Greenhouse Gas Emissions

It is inappropriate to attempt to address greenhouse gas emissions through the NEPA process. The issue of greenhouse gas emissions and their effects on global climate is an important national and global issue, in which FHWA is actively engaged. FHWA is working with other modal administrations through the DOT Center for Climate Change and Environmental Forecasting to develop strategies to reduce transportation's contribution to greenhouse gases - particularly carbon dioxide (CO2) emissions - and to assess the risks to transportation systems and services from climate changes. In these efforts, FHWA has been working with other Federal agencies, including USEPA and US Department of Energy, to evaluate effective approaches consistent with our national goals.

The issue of climate change has been acknowledged by the Bush Administration as an important concern. However, no national approach has yet been set in law or regulation, nor has USEPA established criteria or thresholds for greenhouse gas emissions. Because a national strategy to address greenhouse gas emissions from transportation - and all other sectors - is still being developed, FHWA believes that it is premature to implement policies that attempt to incorporate consideration of greenhouse gas emissions into transportation planning and project development processes. When a national consensus has been reached, it may be appropriate for FHWA to develop guidance for CO2 emissions analysis at some level (national, state or other). This analysis would likely need to be conducted in concert with an overall multi-sector plan for greenhouse gas reductions at a regional or national level.

Greenhouse gases are quantitatively and qualitatively different from other motor vehicle emissions, and their magnitude and breadth appear to require a radically different approach to address their potential climate impacts. First, the amount is far greater; national CO2 emissions are estimated at 6 billion tons annually, compared to hydrocarbon (HC) emissions at 20 million tons. In fact, the generation of CO2 is the direct result of a world economy based on fossil fuel use. Second, HC and other criteria pollutant emissions are of concern, and thus regulated, in individual metropolitan or smaller areas. CO2 emissions are national, even global, in nature, and no regulations or laws currently exist. Third, criteria pollutant emissions last in the atmosphere, and thus are harmful, for perhaps months; CO2 emissions last far longer at over 100 years, and therefore require a much more sustained, intergenerational effort. Because of these concerns, it is apparent that we cannot address CO2 in the same way we might address other vehicle emissions.

From a NEPA perspective, it is analytically problematic to conduct a project level cumulative effects analysis of greenhouse gas emissions on a problem that is global in nature. It is technically infeasible to accurately model how negligible increases or decreases of CO2 emissions at a project scale would add to, or subtract from, the carbon emissions from around the world. Given the level of uncertainty involved, the results of such an analysis would not be likely to inform decision-making at the project level, while adding considerable administrative burdens to the NEPA process. The scope of such an analysis, with any results being purely speculative, goes far beyond the disclosure of impacts needed to make sound transportation decisions. We believe our approach meets the stated purpose of NEPA, in accordance with CEQ regulations, to concentrate on the

analyses of issues that can be truly meaningful to the project decision, rather than simply "amassing" data.

Mitigation for construction-related air pollution

The FEIS contained appropriate commitments for construction-related air pollution. Regarding diesel emissions, one of the commitments in the FEIS specifies that the NHDOT will require contractors involved in the reconstruction/widening of I-93 to include air pollution control devices on heavy diesel construction equipment in accordance with applicable State and Federal laws at the time of construction. The merits and practicality of more stringent or voluntary specification measures will be considered through the final design process and in consultation with the contracting community and NHDES. Emissions from construction equipment may result in elevated ambient concentrations within the immediate vicinity of construction operations for short periods of time, but are not expected to have a substantial impact.

6.5 Transit:

Issues raised in comments on the FEIS:

Commenters noted that the FEIS was flawed because it fails to seek a more sustainable transit (with emphasis on rail) solution that adequately provides for efficient alternatives to commuting by automobile. It was stated that rail would provide a more long-term sustainable alternative than highway expansion without causing strain on the local communities. NHDOT's Selected Alternative represents a conscious, short-term decision to "put off for another day" the challenge of developing a balanced multi-modal transportation system that will continue to work in the long-term and foster more sustainable land use patterns. The analysis used to support the elimination of rail from the reasonable range of alternatives was believed to be deficient. Some felt that NHDOT should re-do its alternatives analysis with a detailed consideration of rail.

Several comments focused on the commitment NHDOT made to engage in a bi-state (with Massachusetts) transit study and to implement the Selected Alternative resulting from that study in a timely manner. It was suggested that NHDOT should develop an EIS or EA and commit to a firm schedule of implementation. It was felt that the purpose of this transit study should be to determine which, not whether a, rail or other transit alternative should be pursued and how to implement and fund it. Commenters cautioned that all reasonable options for transit service in the corridor should be preserved until the transit study has been completed and a preferred option selected. The proposed bikeway along the abandoned Manchester – Lawrence railroad corridor was identified as an issue of concern. If using that rail line would pose an impediment to future rail service, it was felt that NHDOT should defer implementing the recommendations of the Bikeway Feasibility Study until the transit study is completed.

The inability of NHDOT to commit to long-term funding for transit and TDM alternatives that are necessary in the I-93 corridor was identified as a concern. Commenters wanted an ongoing State/Federal commitment to ensure that expanded bus service is maintained with adequate frequency to gain the projected ridership beyond the 3-year CMAQ start-up phase

of the project. The NHDOT was encouraged to continue to work with the MPO's, TMA's and others to pursue different types of incentive programs to encourage high-occupancy vehicle travel along this corridor.

Some thought that the analysis used to support the elimination of rail from the reasonable range of alternatives was deficient in that: a) it lacked coordination with Massachusetts, b) it failed to include ridership from a potential rail station at the Manchester Airport, c) it did not consider the complexities of transit ridership and decision-making by potential transit riders in considering transit modes, d) it failed to consider commuter choice employee benefits and incentives in assessing potential rail ridership, and e) it underestimated both the need for other modes, such as passenger rail, as well as the potential ridership of passenger rail.

FHWA response:

Consideration of Transit

The FEIS appropriately and adequately considered the issue of transit. The analysis used to support the elimination of rail from the reasonable range of alternatives was credible. The most critical factor in the decision to not treat passenger rail service as a stand-alone alternative was the fact that it does not divert a sufficient volume of traffic from the I-93 corridor. A preliminary study estimated rail ridership volumes of about 3000 daily boardings in 2020, compared to the $89,000 \pm to 144,000 \pm vehicles$ projected to utilize I-93. This rail ridership figure would not influence the level of needed expansion of I-93. The decision to not pursue passenger rail service as a stand-alone alternative came down to whether 1) to eliminate an obvious constriction in the I-93 system between Massachusetts and New Hampshire and alleviate vehicular congestion along I-93, or 2) to provide a passenger rail service that was projected to serve only a few thousand riders, leaving 100,000 motorists daily in unacceptable and worsening levels of congestion. A more detailed analysis of the factors influencing passenger rail ridership will be conducted as a part of the Transit Investment Study along with consideration of a rail station at the Manchester Airport.

The Selected Alternative is a balanced and sustainable transportation solution. In addition to improvement to the capacity of the highway infrastructure, the Selected Alternative contains several components that are intended to deal with future growth pressures in the I-93 corridor. These include (1) the additional park-n-ride lots to support carpooling and enhance ride-sharing opportunities; (2) provision for terminal facilities at the three park-n-ride lots to support the expanded and enhanced bus service in the corridor (another component), (3) the protection of a future railroad corridor and commitment to conduct a joint Transit Investment Study with the Commonwealth of Massachusetts to determine the feasibility of a future passenger rail service, and (4) implementation of the Salem to Concord Bikeway Feasibility Study.

The Selected Alternative provides several options for commuters in the corridor that could serve short and long-term needs. Throughout the public involvement process, NHDOT has been explicit that they do not plan to expand I-93 to more than four through lanes in each direction, and they intend to depend upon these other transportation options to maintain the

sustainability of the corridor. We view this position as both balanced and appropriate and support this long-term solution.

Transit Study with Massachusetts

The NHDOT has committed to complete a multi-state transit study with Massachusetts. The commitment that NHDOT made regarding the consideration of a rail alternative was included in a multi-agency MOA, which specifically states "(T)o the extent permitted by law, the partnering agencies agree to support and seek funding for the transit study, as well as its eventual implementation." It is clear that the commitment was to implement the study. It is also clear that the results of the study and the cooperation of the Commonwealth of Massachusetts would dictate what further course of action is pursued. Thus, until that study is advanced and an understanding is reached with Massachusetts, no commitment regarding implementation, or the required environmental studies related to its implementation, can be made. However, expanded bus service and additional park-n-ride lots and bus stations will be available through the I-93 construction period. The purpose of the transit study will be to evaluate in more detail the long-term rail and transit needs for the corridor and viable options, as well as the implementation and funding processes. The necessary public involvement procedures will be followed as this transit study is advanced.

The NHDOT will not take any actions that would preclude implementation of transit options in this corridor. The NHDOT also plans to acquire the necessary right-of-way to maintain the viability of a possible future rail corridor in the median of I-93. The proposed bikeway along the abandoned Manchester – Lawrence railroad corridor will not pose an impediment to future implementation of rail service along this corridor. Many such abandoned rail corridors throughout the State have been used as recreational paths with the intention of retaining them for future rail usage when and if that becomes desirable. Additionally, public use of the corridor would help to keep the corridor free from intrusions and well maintained. The NHDOT proposed the acquisition of a portion of the Manchester – Lawrence line in Salem, which Guilford Transportation was seeking to sell, but it did not get concurrence from the Governor and Executive Council. While we agree that later acquisition of this land for a rail corridor, if it becomes the selected option from the Transit Study, will be more costly, this added cost will be minor compared with the total cost of implementing rail service and would not foreclose this option.

Transit will continue to become an increasingly important component of NH's transportation system and its importance will be accelerated as the capacity of an improved I-93 corridor is approached. However, meaningful rail service cannot be implemented without the cooperation and participation of the Commonwealth of Massachusetts. An integrated, diverse transportation system is the ideal solution to address future demands in this corridor.

Funding

The NHDOT and FHWA are supportive of the transportation alternatives and are committed to start-up costs and early financial support that will hopefully provide time for these alternatives to become self-supporting. This is consistent with Federal policy for CMAQ projects. CMAQ funds are eligible for the first three years of any new or expanded

service. Other Federal highway funds that are eligible for this project can be used to subsidize and to provide service during the entire construction period. Federal funds for continued transit subsidy beyond this could be pursued from FTA or other sources. A marketing component is also included as a part of the start-up phase. The FEIS addresses NHDOT's planned activities to promote high-occupancy travel along the corridor. Multi-modal transportation planning is an important element of the process, as the investment in park-n-ride facilities demonstrates.

6.6 Indirect and Cumulative Impacts:

Issues raised in comments on the FEIS:

Comments were received stating that the FEIS failed to properly evaluate indirect impacts. They claimed that the analysis was flawed for the following reasons: (1) NHDOT failed to engage in any sort of comparative analysis of the induced growth and development impacts of specific alternatives; (2) the results of this analysis reflect unrealistic assumptions about where, how, and how much development will result from the highway expansion; and (3) the amount of development that will result from the highway expansion was underestimated, creating an understatement of the indirect impacts to wetlands, upland areas, natural habitats and native wildlife communities

Also, commenters suggested that the FEIS selectively concluded that the Delphi analysis was "speculative" and therefore not worthy of further consideration. They suggested that traffic from induced development, which was identified in the Delphi analysis, was improperly omitted from the "build" traffic forecasts. Commenters charged that the FEIS failed to properly evaluate cumulative impacts.

Additional mitigation and protection of natural areas against future growth and development was sought. Some commenters suggested that the CEQ regulations require that future impacts that can be reasonably expected should be considered in the EIS and mitigated. A few also expressed a desire for increased funding for technical assistance for communities to address growth issues, beyond that identified in the EIS. Specifically, the Town of Deerfield asserted that it is the NHDOT's responsibility to mitigate growth because there is a relationship between highway expansion and sprawl. They stated that local communities can control the type and the timing of the development, but they cannot prevent it. They noted that most towns in New Hampshire do not have the planning tools, ordinances, or professional or financial resources adequate to prepare for the increased pressure for residential subdivision that is a certain result of the I-93 expansion.

FHWA response:

Commenters utilized the terms "cumulative impacts", "secondary impacts" and "indirect impacts" almost interchangeably in their comments. The following is a brief description of these terms and how they are defined:

The CEQ regulations define "indirect effects" as effects that are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in

the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems. The term, "secondary impacts", does not appear, nor is defined in either the CEQ regulations or related guidance. However, the term is used in FHWA's Position Paper: Secondary and Cumulative Impact Assessment in the Highway Project Development Process, which incorporates the CEQ definition of indirect impacts. Therefore, the terms indirect and secondary are interchangeable, for the purposes of this analysis.

The CEQ regulations define "cumulative impact" as the impact on the environment, which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Indirect (Secondary) Impacts and the Delphi Process

A thorough analysis of the indirect impacts of the project was conducted and presented throughout the Environmental Consequences section, Section 4.0, in the FEIS. The potential for indirect (secondary) impacts relative to the following resources was specifically discussed: air quality; surface water; groundwater; floodplains; farmlands; wetlands, wildlife; threatened and endangered species; noise; and, land use. An extensive and detailed analysis of secondary land use, including the use of an Expert Panel, is outlined in Section 4.12 of the FEIS. Section 4.12 describes the Delphi Process and Expert Panel, which were used to predict future trends in the region in regard to population and employment. Utilizing the Delphi Process, an Expert Panel, (a group of selected individuals, familiar with the area, real estate, development, etc.) was tasked with projecting the potential change in population and employment in the 29-community secondary study area based on their best professional judgment.

FHWA and NHDOT dispute the claim that the results of the Delphi Process were dismissed and not fully considered. As noted below, the results were fully integrated into the indirect (secondary) analysis. The Expert Panel estimated an additional 138,000 people (a 23% increase over the 2000 Census population of 605,000) in the study area by 2020 without the project. With the project, the Expert Panel estimated an additional 41,000 people (5.5% increase over the projected 2020 No-Build estimate). The analysis of this Four-Lane Build Alternative, in combination with the No-Build Alternative established a range of potential growth to consider. Anticipated growth resulting from the improvement of I-93 is small, compared with growth that is anticipated without the project. Thus, a comparative analysis of further alternatives (i.e., the Three-Lane Alternative or Combination Alternative) was not considered necessary.

The information from the Expert Panel was used to estimate the acres of land that would likely need to be converted to accommodate these levels of residential and employment development. An inventory of available developable land in each community was prepared and compared to the potential development pressure. Then, a qualitative evaluation of the added impact, associated with this level of development, was made on important resources, such as wetlands, farmlands, wildlife, etc. This evaluation used appropriate and realistic

assumptions about the likely presence of specific resources (i.e., wetlands) within the area to be converted, regardless of the protections, such as those applying to wetlands, under Federal, State, and local statutes. Given the complexities of land use, transportation, economics, and environmental regulation, it is not possible to attribute and forecast with certainty the environmental impacts associated with future secondary growth.

Section 1508.8(b) of the CEQ regulations state that an "EIS must identify all the indirect effects that are known, and make a good faith effort to explain the effects that are not known but are "reasonably foreseeable." As evidenced in Section 4.0, the FEIS identified the known indirect impacts, and through the Delphi process conducted a good faith effort to estimate the reasonably foreseeable indirect effects that are known. We developed reasonable estimates for changes in population and job growth. Those reasonable estimates were used to estimate the acres of land that would likely need to be converted to accommodate these levels of residential and employment development. The potential environmental impacts associated with the estimated amount of converted land were then evaluated. We cannot identify specific locations in each town where this development will Many factors contribute to this including the limited control over individual property owners' actions and the inability to predict future growth management strategies such as changes to local planning and zoning, the economy, availability of sewer and water, schools, cost and availability of land/housing, and communities' limitation on the number of building permits. The focus of the analysis was on reasonably foreseeable actions, those that are likely to occur or probable, rather than those that are merely possible. Any further attempt to predict future secondary impacts would be speculative.

The analysis in the FEIS provides local officials, planners and public citizens an estimate of the existing condition and the possible future pressure relative to potential development activity that might be fostered, in part, by the widening of I-93. Local officials have the ability to manage growth in their communities through appropriate zoning and planning ordinances. Municipalities also have the opportunity to levy impact fees on new development for a proportional share of local capital cost burden caused by that development under state law (NH RSA 674.21, Innovative Land Use Controls). Additionally, state law (NH RSA 674.22, Growth Management: Timing of Development) allows a community to determine and regulate its rate of growth. Several NH municipalities currently control the number of building permits that are issued annually. Hence, a community has the ability to control the timing and character of its growth and to recover impact costs from development proponents.

On the matter of natural resources, NHDES and USEPA, as well as the local officials, have specific authorities under wetland legislation to protect important resources from inappropriate development and discharges to aquatic resources. We would expect that they would be applied to such development to control these potential impacts and that appropriate mitigation would be required of the developer.

Induced Traffic

Although traffic modeling and prediction is not an exact science, the traffic analysis has the benefit of long-term traffic monitoring, as well as the availability of comprehensive traffic

models reflecting existing and projected land use, etc. While we agree that there is a level of uncertainty involved in any prediction, the level of information and trends available through the regional traffic forecasting models for the urbanized areas were more comprehensive than that used in the Delphi Process. The projections generated by the Delphi Panel are in some part already recognized and accounted for in the modeling process that used information generated through regional planning commissions' models. This modeling process is produced by professionals in this field (those that provided the traffic information to the Delphi Panel) and involves coordination with the local planners from each of the communities within the model area. It utilizes demographic information and projections from the NH Office of Energy and Planning, and local master plans. It also uses data such as the number of households in each traffic analysis zone, broken down by vehicle availability, income level, number of persons, number of workers, etc. The statewide traffic model already recognizes a 5 to 8% increase in generated traffic between the future Build and No Build Alternatives.

In response to comments on the FEIS concerning the potential effects of the Delphi Panel's population and employment projections, a further traffic analysis reflecting the induced traffic that may possibly occur was conducted. When this added potential traffic is considered, the Selected Alternative would provide LOS F from Exit 1 south, LOS E from Exit 3 south, and LOS C north of Exit 3. The Three-Lane Alternative would obviously perform worse with the induced traffic factored into the analysis.

Even when you consider the additional potential traffic from the Delphi process, the following conclusions are still valid:

- There is substantial new capacity being added.
- There will be an improved level of service compared to the existing condition.
- Operating conditions will be substantially better than the No-Build condition of corridor-wide failure.
- The conclusion does not change, i.e. the southern tier was known to be congested, and the NHDOT will not pursue an improvement greater than four lanes in each direction.
- The observable benefit was not necessarily in the peak hour but in the reduction of congested hours each day.
- The higher volumes increase the need for capacity and safety improvements in the corridor and reinforce the decision to pursue the Selected Alternative (four lanes in each direction).

Since the preliminary study of rail ridership indicated it could only reach approximately 3000 daily boardings, if I-93 remained as two lanes in each direction, and the levels of service are better than the no-build condition, the induced traffic caused by growth projected from the Delphi Panel would induce only a minor increase in the number of boardings on a rail alternative within the corridor. Rail would not divert a level of traffic sufficient to reduce the need to widen I-93. Preliminary evaluations of all modal options, and combinations thereof, identified the I-93 improvements as providing substantially greater transportation benefits to more people than other modal improvements (Table 2.3-6

in the FEIS.)

Cumulative Impacts

Consideration of the potential cumulative impacts of the project was adequate. As noted in the definition provided above, cumulative impacts are those that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions. Cumulative impacts, to the extent that they were reasonably foreseeable, were identified in Section 4.11.2 of the FEIS. This section summarizes the cumulative impacts analysis of the proposed project.

The current state of each of the important resources was discussed in the Affected Environment section of the FEIS. As appropriate, a synopsis of past events that led to the current condition was included. Section 4.11.2 identifies a number of present and future regionally significant projects and developments, including other transportation improvements.

When developing their population and employment growth projections, the Expert Panel, which was comprised of realtors, academia, regional planners, local officials, public interest groups, et al., considered the effects of other present and future actions with the study area as evidenced by their estimated increase in population and growth under the nobuild alternative. In preparation for their analysis, the Expert Panel members were provided with a briefing book containing information related to the study area and local population, housing and employment trends, as well as income data, traffic data, and roadway construction activities, maps illustrating development opportunities and constraints, and planning land use regulations. Supplemental information, that was requested by the Panel and provided, included a map of the cities and towns within the commute shed for the project, population and employment information for communities beyond the basic study area, revised tables from the briefing book, travel times between selected origins and destinations for current and future No-Build and Build scenarios and sewer and water service availability within the study area.

The air quality analysis did include a consideration of other major proposed developments and their consequences. The regional air quality conformity process inherently considers all Federally funded highway and transit projects plus other known projects that are deemed to be regionally significant. However, other developments, many of which are private, typically are not required to perform a comprehensive environmental analysis, and thus specific data is lacking on their future effects on other resources.

Potential ramifications of these projects in conjunction with the widening of I-93 were listed in Section 4.11.2. The possible cumulative effects identified included the following: (1) an improved transportation system; (2) a stronger transportation relationship with Boston, MA regional economy; (3) renewed growth and development patterns from regional sources; (4) pressures for increased development; (5) increased pressure for conversion to commercial and industrial uses; (6) greater potential for additional separation

of land uses; (7) potential water shortages; (8) potential loss of natural resources; (9) potential need for additional public facilities; (10) increasing property values; and (11) potential loss of those elements that define today's landscape creating a town's perceived small-town rural character. We have taken substantial steps to identify cumulative impacts that are known, and it would not be prudent to engage in speculation or contemplation about uncertain future plans.

Mitigation and Enhancement

The mitigation package for the project is comprehensive. Refer to the wetlands section above for a discussion of the proposed mitigation for wetland impacts. The complete proposed mitigation package for this project is included in Section 11, Project Commitments, of the FEIS. In addition to the extensive mitigation package, NHDOT has developed the Community Technical Assistance Program in recognition that many communities do not have the expertise to deal with potential growth pressures.

The Community Technical Assistance Program is a \$3.5 million grant for technical planning to allow communities to better manage potential growth pressures. The program is envisioned as a joint effort of state and private organizations to help communities better manage growth and advance conservation efforts. The following types of tools and services are anticipated as part of the Community Technical Assistance Program: (1) direct technical assistance to communities; (2) funding for innovative projects proposed by communities; (3) training and education for professionals and local officials; (4) a marketing campaign to raise public awareness of smart growth; (5) analyses of alternative future growth scenarios; and (6) development of specific tools and materials to support local planning and conservation efforts. The program is intended to assist the five "primary communities as well as the twenty-one "secondary" communities. The assistance is complimentary and builds on the efforts of two other initiatives: the Governor's Initiative on Sprawl and the Grow Smart New Hampshire effort.

6.7 Social Capital:

Issues Raised in Comments on the FEIS:

Commenters stated that the FEIS failed to adequately assess the impacts of the proposed project on social capital, and that the NHDOT and its partner agencies bear responsibility for these impacts. They believe that the degree of widening of I-93 will weaken the social bonds of the community. The commenters were concerned that current guidance was not followed and cited three different laws or guidelines related to social capital: (1) "Guidelines and Principles for Social Impact Assessment," which encourages examination of indicators related to social capital; (2) the Federal Aid Highway Act of 1970 which requires FHWA to consider a broad range of social factors, including "community cohesion"; and (3) FHWA's guidance on "Community Impact Assessment" which identifies how "community cohesion and interaction" are impacted by major transportation projects.

FHWA response:

Consideration of social and economic impacts

There was a comprehensive and thorough evaluation of the project's social and economic impacts in accordance with FHWA's Environmental Regulations in 23 CFR 771; FHWA Technical Advisory T-6640.8A, entitled "Guidance for Preparing and Processing Environmental and Section 4(f) Documents"; and, the principles contained in 23 USC 109(h) which originated in Federal-Aid Highway Act of 1970. The Technical Advisory outlines issues to be considered when analyzing a project's social, land use, economic, and relocation impacts. 23 USC 109(h) lists the types of adverse social and economic impacts that must be investigated and documented: noise; destruction or disruption of man-made resources, aesthetic values, community cohesion, and availability of public facilities and services; employment effects; tax and property losses; displacement of people, business, and farms; and, disruption of desirable community and regional growth. Section 3.11 of the FEIS discussed the socio-economic resources within the project area including demographics, land use, zoning, public utilities, community environment, and commuting patterns. Potential impacts to those resources were analyzed in Section 4.11 of the FEIS.

As reinforced in FHWA's "Community Impact Assessment" publication (a reference document prepared by state and local transportation professionals in consultation with FHWA) the heart of a good community impact assessment is a strong public involvement effort. It is through public involvement that neighborhoods and important community facilities are identified and it is through public involvement that acceptable methods to address these impacts can be determined. There was an extensive public involvement process used on this project to solicit any and all concerns related to the proposal and all reasonable measures were taken to minimize impacts associated with this project. The NHDOT's public involvement process on this project was exceptional.

The "Principles and Guidelines for Social Impact Assessment (SIA) in the USA" document referenced by a commenter was developed by the Interorganizational Committee on Principles and Guidelines for Social Impact Statement, a private association of social scientists. The document states that it "provides discretionary guidance." While it may present some worthwhile principles, it has not been adopted by FHWA as a guidance document.

Social Capital

Social capital is very difficult to assess and predict. It involves personal choices of citizens to be involved in their community, which is influenced by many factors beyond accessibility. While improvement on the I-93 corridor may have the potential to encourage longer commutes, it will reduce the congestion on I-93, thereby decreasing travel times that are currently endured by residents of southern New Hampshire. Improving the mobility of the current residents along the I-93 corridor has the ability to strengthen social capital. This project will alleviate congestion on an existing principal arterial corridor, not create a new one. The commenters had pointed out that data seems to indicate that each additional ten minutes of commuting time results in a 10 percent decline in civic activity. Since this will achieve a reduction in commuting times along I-93 into the foreseeable future, many local residents, who currently find themselves delayed by congestion along the I-93 corridor,

could choose to increase the time that they devote to community activities. Thus, there could be a positive aspect towards social capital as a result of this improvement.

7.0 CONCLUSION

FHWA was thoroughly involved in the development of the DEIS and the FEIS and we participated in the interagency meetings and field reviews on this project, as well as the meetings of the Advisory Task Force (of which we were a member), local officials and public informational meetings, and the public hearings on November 12 and 14, 2003. We evaluated and considered all feedback throughout this process.

This ROD's Selected Alternative was the subject of the NHDOT's November 12 and 14, 2003 public hearings, which were conducted jointly with the USACE and the NHDES. On December 30, 2003, the ACOE advised that they had identified the Selected Alternative as their Least Environmentally Damaging Practicable Alternative.

June 28, 2005

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FHWA – NH Division